

Japanese Utility Model Laid-Open No. 56-130832

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Request for Utility Model Registration

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To: Yoshio KAWAHARA, Commissioner of Patent Office

1. Title of the Device:

Heat-resistant Board

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4. List of Attached Documents:

(1) Specification	1
(2) Drawing	1
(3) Copy of Request	1

## Specification

### 1. Title of the Device:

Heat-resistant Board

### 2. Claims of Utility Model:

1. A heat-resistant board, wherein a base is integral with a sprayed heat-resistant inorganic material via an adhesive layer.
2. The heat-resistant board according to claim 1, wherein the sprayed heat-resistant inorganic material layer consists essentially of an inorganic fiber and an inorganic binder.
3. The heat-resistant board according to claim 2, wherein the inorganic fiber is rock wool and the inorganic binder is cement.
4. The heat-resistant board according to claim 1, wherein the base is selected from the group consisting of a woody board, a plastic board, a foamed plastic board, a cement board, a gypsum board, a fiber-reinforced cement board, a calcium silicate board, and a wood wool board.
5. The heat-resistant board according to claim 1, wherein the sprayed heat-resistant inorganic material layer is formed by spraying, from 1000 mm or more distance, a material comprising 30 to 70 % of rock wool, 0 to 20 % of vermiculite, 20 to 40 % of portland cement or blast furnace cement, and 0 to 20 % of gypsum, together with water and air.

### 3. Detailed Description of the Device:

The present device relates to a heat-resistant board having light weight, acoustic absorption, incombustibility, and other features, wherein a base is integral with a sprayed heat-resistant inorganic material via an adhesive layer.

The present device is hereinafter described by one embodiment shown in a figure. In the figure, there are a base 1, an adhesive layer 2, and a sprayed heat-resistant material layer 3.

The base 1 can be made of any material such as wood, synthetic resin, metal, ceramic, or concrete. When importance is placed on lightness, wood, synthetic resin or the like is preferred. When importance is placed on fire resistance, an inorganic fiber board, fiber-reinforced concrete or the like is preferred. The base 1 can have any shape, but use of a plate-shape material allows the sprayed heat-resistant material layer to have a uniform thickness. Therefore, preferred examples of the base include a woody board, a plastic board, a foamed plastic board, a cement board, a gypsum board, a fiber-reinforced cement board, a calcium silicate board, and a wood wool board.

An adhesive to be used for the adhesive layer 2 can be selected from any of organic adhesives such as synthetic resin adhesives or any of inorganic adhesives such as alkaline silicate in consideration of affinity with the base. When the base is a woody board, a synthetic resin board, or a concrete board, preferred is vinyl acetate adhesive, urea melamine cocondensation resin adhesive or the like. When the base is a combustible material such as a woody board, a synthetic resin or the like, a fire retardant such as phosphate fire retardant is preferably added to the adhesive. The applied amount of the adhesive varies depending upon the kind of the adhesive, but 5 to 100 g/m<sup>2</sup> of the adhesive is typically applied.

The sprayed heat-resistant material layer 3 comprises inorganic fibers and an inorganic binder as main components, and the layer may additionally contain aggregates, and small amounts of a tackiness agent, a coloring agent, an organic adhesive and the like. As the inorganic fiber, rock wool, glass wool, asbestos, and the like can be used, but rock wool is better in view of performance. As the inorganic binder, gypsum, silicates, lime, and the like can be used in addition to cement, but a cement such as blast furnace cement or portland cement is preferred. In addition, as the aggregates, bentonite, vermiculite, perlite, inorganic powder, etc. can be added if

necessary. Use of vermiculite, perlite, etc. improves lightness. Further, a pressure-sensitive adhesive such as carboxymethyl cellulose, a coloring agent, a paste, and an organic adhesive such as poly(vinyl acetate) can be optionally added in a small amount. The ratio of the inorganic fiber to the inorganic binder is preferably 1:0.5 - 2.

One preferred example is a material, for example, comprising 30 to 70 % of rock wool, 0 to 20 % of vermiculite, 20 to 40 % of portland cement or blast furnace cement, and 0 to 20 % of gypsum.

The sprayed heat-resistant material layer 3 is provided by spraying a material having the above composition toward the base 1 provided with the adhesive layer 2. As a spraying method, the following method are known: a wet method wherein a slurry of materials such as inorganic fiber, an inorganic binder, etc. is sprayed together with air; a dry method wherein dry materials are sprayed with water and air; and a semi-wet method wherein a slurry containing one of the inorganic fiber and the inorganic binder and the other as it is dry are sprayed with air. However, the dry and semi-wet methods using a slurry of the inorganic fiber are better in that the thickness and density of the sprayed heat-resistant material layer are made as even as possible. In particular, a board having the sprayed heat-resistant material layer 3, 10 mm or less in thickness, preferably about 5 mm, is excellent in view of handling operation and other points. However, since it is difficult to spray them uniformly so as to have such thickness, it is desirable to spray them according to the following method. That is, while a spray gun is held at a height of 1000 mm or more from the base 1, spraying is carried out just like falling snow. Thereafter, the sprayed layer is pressed with a roller or a trowel so as to finally have a predetermined thickness. Then, the sprayed heat-resistant material layer 3 having a uniform density and a smooth surface can be obtained. It should be noted that a common dry spraying machine can be used in this device.

The heat-resistant board of the present device may be provided or coated with a thin film on its surface for beautiful appearance and dust proof. Further, an adhesive layer may be provided on the back surface of the base or reinforced screw holes, etc.

may be provided at required locations of the base for installing the heat-resistant board firmly and easily.

4. Brief Description of Drawing:

The figure is a cross-sectional view of a heat-resistant board of the present device. In the figure, there are a base 1, an adhesive layer 2, and a sprayed heat-resistant material layer 3.

Applicant of Utility Model Registration: Nippon Steel Chemical Co., Ltd.